An Overview of Canada's Nuclear Waste Plan

An Environmental Justice Review

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Agenda

1. **Canada's Plan for the Storage of Nuclear Waste**
- Nuclear Waste Management Organization
- *Nuclear Fuel Waste Act*

2. **Applicable Legislation and Regulations**
- Environmental justice principles
- Application of principles within nuclear law

3. **Community Profile: Ignace**

I. Canada's Plan for the Storage of Nuclear Waste

- Canadian reactors produce approx. **90,000** used CANDU fuel bundles per year.
- If Canada's existing reactors operate to the end of their planned current lives, inventory of used fuel will be approx. **5.2 million bundles**
- Current plans for developing a deep geological repository, transportation system, and long-term management are estimated at **$16 – 24 billion**
  - To be funded by Ontario Power Generation, NB Power, Hydro-Quebec, and Atomic Energy of Canada Ltd

I. Canada's Plan for the Storage of Nuclear Waste (con't)

- The Government of Canada, through the *Nuclear Fuel Waste Act*, assigned the **Nuclear Waste Management Organization** with the task and responsibility of managing used fuel produced at Canadian nuclear power plants
- In May 2010, the NWMO began its site selection process for a willing community to host a deep geological repository (DGR) used to store Canada's used nuclear fuel
- Proposed DGR would be composed of a network of underground tunnels and rooms, meant to isolate and contain highly radioactive used fuel bundles – 500 m underground, approximately 2km x 3km in size

I. Canada's Plan for the Storage of Nuclear Waste (con't)

Getting Ready	**The NWMO publishes the finalized siting process, having briefed provincial governments, the Government of Canada, national and provincial Aboriginal organizations, and regulatory agencies on the NWMO's activities.** The NWMO will continue briefings throughout the siting process to ensure new information is made available and requirements which might emerge are addressed.
Step 1	**The NWMO initiates the siting process with a broad program to provide information, answer questions and build awareness among Canadians about the project and siting process.** Awareness-building activities will continue throughout the full duration of the siting process.
Step 2	**Communities identify their interest in learning more, and the NWMO provides detailed briefing. An initial screening is conducted.** At the request of the community, the NWMO will evaluate the potential suitability of the community against a list of initial screening criteria (outlined on page 30).
Step 3	**For interested communities, a preliminary assessment of potential suitability is conducted.** At the request of the community, the NWMO will conduct a feasibility study collaboratively with the community to determine whether a site has the potential to meet the detailed requirements for the project. Interested communities will be encouraged to inform surrounding communities, including potentially affected Aboriginal communities and governments, as early as possible to facilitate their involvement.
Step 4	**For interested communities, potentially affected surrounding communities are engaged if they have not been already, and detailed site evaluations are completed.** In this step, the NWMO will select one or more suitable sites from communities expressing formal interest for regional study and/or detailed multi-year site evaluations. The NWMO will work collaboratively with these communities to engage potentially affected surrounding communities, Aboriginal governments and the provincial government in a study of health, safety, environment, social, economic and cultural effects of the project at a broader regional level (Regional Study), including effects that may be associated with transportation. Involvement will continue throughout the siting process as decisions are made about how the project will be implemented.
Step 5	**Communities with confirmed suitable sites decide whether they are willing to accept the project and propose the terms and conditions on which they would have the project proceed.**

I. Canada's Plan for the Storage of Nuclear Waste (con't)

Step 6	**The NWMO and the community with the preferred site enter into a formal agreement to host the project.** The NWMO selects the preferred site, and the NWMO and community ratify a formal agreement.
Step 7	**Regulatory authorities review the safety of the project through an independent, formal and public process and, if all requirements are satisfied, give their approvals to proceed.** The implementation of the deep geological repository will be regulated under the *Nuclear Safety and Control Act* and its associated regulations to protect the health, safety and security of Canadians and the environment, and to respect Canada's international commitments on the peaceful use of nuclear energy. Regulatory requirements will be observed throughout all steps in the siting process. The documentation produced through previous steps, as well as other documentation that will be required, will be formally reviewed by regulatory authorities at this step through an Environmental Assessment and then licensing hearings related to site preparation and construction of facilities associated with the project. Various aspects of transportation of used nuclear fuel will also need to be approved by regulatory authorities.
Step 8	**Construction and operation of an underground demonstration facility proceeds.** The NWMO will develop the centre of expertise, launched in Step 4, to include and support the construction and operation of an underground demonstration facility designed to confirm the characteristics of the site before applying to regulatory authorities for an operating licence. Designed in collaboration with the community, it will become a hub for knowledge-sharing across Canada and internationally.
Step 9	**Construction and operation of the facility.** The NWMO begins construction of the deep geological repository and associated surface facilities. Operation will begin after an operating licence is obtained from regulatory authorities. The NWMO will continue to work in partnership with the host community in order to ensure the commitments to the community are addressed throughout the entire lifetime of the project.

II. Applicable Legislation & Regulations

Environmental Justice Principles

Sustainable Development

Canada's environmental protection strategies are driven by environmentally sustainable economic development, which includes a clean and healthy environment as well as a strong economy. Sustainable development is said to that which meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

The Precautionary Principle

This principle is recognized internationally and requires that "where there are threats of serious irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measure to prevent environmental degradation"

II. Applicable Legislation & Regulations

Most aspects of the nuclear project are within federal jurisdiction but provincial environmental protection and water protection laws may apply, as well as provincial occupational health and safety laws.

The transportation of used nuclear fuel will be jointly regulated by the Canadian Nuclear Safety Commission (**CNSC**) and Transport Canada.

The NWMO must demonstrate how it meets its international obligations under the *Joint Convention on the Safety of Spent Fuel management and on the Safety of Radioactive Waste Management*

The CNSC is responsible for issuing the necessary licenses needed to implement each phase of the NWMO's Adaptive Phase Management plan including the geological repository.

II. Applicable Legislation & Regulations

Environmental Justice Principles

- *Canadian Environmental Protection Act* ***(CEPA)****:* the protection of the environment is essential to the well-being of Canadians and the primary purpose of the act is to contribute to sustainable development through pollution prevent
- CEPA does not apply to radionuclides as *Nuclear Safety and Control Act* deemed a more appropriate federal statute to manage the risks posed by radionuclides
- However, caselaw demonstrates precautionary principle is indeed an international obligation to which Canada is subject to. As such, when performing duties of regulation, the CNSC should consider the precautionary principal when issuing relevant licensing to deep geological repositories.

III. Community Profile
Ignace

IV. Looking Ahead

- NWMO's plan to store this fuel in a deep geological repository runs contrary to the environmental justice principal called the precautionary principle.
- The presence of high temperature, microbes, chemical reactions, creep, fractures in the host rock, and intense climactically driven changes, pose just some of the threats safely isolating harmful used fuel from the local community and environment for thousands of years.
- Canadian caselaw has shown that this principle must be used when interpreting and developing national legislation, including *the Nuclear Safety and Control Act.*